

## CLAIMS

2

### I CLAIM:

1. A hydrodynamic suturing instrument, comprising in combination:
  - 2 a syringe having a barrel and plunger and a connector for detachably mounting a needle,  
the barrel having a capacity to receive a predetermined size and length of suture and sufficient  
4 fluid to draw the suture into the barrel and to expel the suture from the barrel;  
  
an elongated cannulated suturing needle having a proximal end and a distal end, a lumen  
6 of a size to receive said predetermined size and length of suture extending from said proximal  
end to an opening at said distal end for the passage of a suture, a connector at said proximal end  
8 adapted to connect to said syringe barrel connector and said distal end configured to pass with a  
suture through tissue; and  
  
10 said distal end configured with a sharp point extending forward of said opening to said  
lumen, said opening configured to receive a suture extending from said lumen along an outer  
12 surface of said needle wherein said sharp point extends forward of said suture.
  2. A suturing instrument according to claim 1 wherein said needle has a curved  
2 configuration at said distal end.
  3. A suturing instrument according to claim 2 wherein said curved configuration is a  
2 cork screw configuration.
  4. A suturing instrument according to claim 2 wherein said curved configuration is a  
2 hook configuration.

2 5. A suturing instrument according to claim 1 wherein said opening at said distal  
end is at a side of said cannula and the trailing of said opening is rounded.

2 6. A suturing instrument according to claim 5 wherein curved configuration is a  
cork screw configuration.

2 7. A suturing instrument according to claim 5 wherein said curved configuration is a  
hook configuration.

2 8. A suturing instrument according to claim 1 further comprising stiffening cover  
over a major portion of said needle.

2 9. A suturing instrument according to claim 1 further comprising:  
a forceps having a distal end with jaws and a proximal end with a lever to operate  
at least one of said jaws and a lumen extending from said proximal end to said distal end  
4 for passage of said needle; and

6 said jaws having an opening enabling passage of said needle through tissue  
grasped in said jaws.

10. A suturing instrument according to claim 9 wherein said needle is curved.

2 11. A suturing instrument according to claim 10 wherein said lumen has an oval  
configuration to aid in orienting said needle.

2 12. A suturing instrument comprising:  
an elongate tubular member having a distal end and a proximal end and a passage  
extending from said proximal end to said distal end;

4 first and second jaws on said distal end disposed in opposed relation, one of said first and  
second jaws being moveable relative to the other and having an opening there through, the other  
6 of said first and second jaws including an open end of said passage oriented toward said opening;  
means at said proximal end for moving said moveable jaw between open and closed  
8 positions;

a syringe having a needle, the needle of sufficient length to extend a forward end thereof  
10 through said passage past said open end and through said opening in said one of said jaws, the  
needle having a cannula of sufficient size to receive a suture; and  
12 said syringe having sufficient capacity to draw a predetermined length of suture and  
liquid into said needle and expel said suture through said opening.

13. A suturing instrument according to claim 12 wherein said needle has a curved  
2 configuration at said forward end.

14. A suturing instrument according to claim 13 wherein said lumen has an oval  
2 configuration to aid in orienting said needle.

15. A method of suturing comprising the steps of:  
2 providing an elongate needle having a distal end and a proximal end and a lumen  
extending from said proximal end to said distal end having sufficient size for passage of a  
4 predetermined size suture, said distal end having a tip configured for passage with a suture  
through a tissue;

6 providing a syringe detachably connected to said needle proximal end;  
selecting and introducing a length of suture into at least said needle;

8 filling said syringe with a quantity of liquid;  
passing said distal end of said needle with said suture through a tissue to be sutured; and  
10 expelling said length of suture from said distal end of said needle by hydraulic force from  
a quantity of said liquid in said syringe.

16 A method of suturing according to claim 15 wherein said step of selecting and  
2 introducing a length of suture into at least said needle comprises:  
inserting an end of said suture into said distal end of said needle;  
4 submerging said distal end of said needle with said suture in a quantity of liquid; and  
drawing said length of suture and a quantity of liquid into said needle with said syringe.

17 A method of suturing according to claim 16 wherein said needle is provided to  
2 have a curved configuration at said distal end.

18 A method of suturing according to claim 15 wherein said needle is provided to  
2 have a stiffening cover over a major portion of said needle.

19. A method of suturing according to claim 15 further comprising the steps of:  
2 providing an elongate tubular member having a distal end and a proximal end and a  
passage extending from said proximal end to said distal end, first and second jaws on  
4 said distal end disposed in opposed relation, one of said first and second jaws being  
moveable relative to the other and having an opening there through, the other of said first  
6 and second jaws including an open end of said passage oriented toward said opening, and  
means at said proximal end for moving said moveable jaw between open and closed  
8 positions;

providing said elongate needle of sufficient length to extend said distal end thereof  
10 through said passage past said open end and through said opening in said one of said  
jaws; and

12 grasping a tissue to be sutured between said first and second jaws; and  
extending a said distal end thereof through said passage past said open end through said  
14 tissue and through said opening in said one of said jaws.

20. A method of suturing according to claim 19 wherein said needle is provided to  
2 have a curved configuration at said distal end; and  
said passage having an oval configuration to accommodate and maintain said curved  
4 needle oriented.